

The Claims

What is claimed is:

- 1 1. A corner-cube reflector having three reflective surfaces comprising:
2 at least one of said reflective surfaces being a surface of a bimaterial cantilever that
3 changes between a substantially planar shape and a curved shape upon exposure to an agent of
4 interest.

- 1 2. The apparatus of claim 1 wherein said bimaterial cantilever is chosen from the bimaterial
2 group of Au-Si, Pd-Si, Au-Si₃N₄, and Pd-Si₃N₄.

- 1 3. The apparatus of claim 1 wherein an agent sensitive coating is disposed on a surface of
2 said bimaterial cantilever, said agent sensitive coating being substantially transparent to said
3 electromagnetic radiation.

- 1 4. The apparatus of claim 1 wherein an agent sensitive coating is disposed on a surface of
2 said bimaterial cantilever, said agent sensitive coating being substantially reflective of said
3 electromagnetic radiation.

- 1 5. An apparatus comprising:

Navy Case No. 84930

2 a reflector having three reflective surfaces that are mutually orthogonal when said
3 reflector is in a first condition, wherein at least one of said reflective surfaces is a surface of a
4 bimaterial cantilever that goes from a substantially planar shape when said reflector is in said
5 first condition to a curved shape when said reflector is in a second condition;

6 a source of electromagnetic radiation for projecting said electromagnetic radiation to said
7 reflector; and

8 a detector disposed to receive electromagnetic radiation as reflected from said reflector.

1 6. The apparatus of claim 5 wherein said bimaterial cantilever is chosen from the bimaterial
2 group of Au-Si, Pd-Si, Au-Si₃N₄, and Pd-Si₃N₄.

1 7. The apparatus of claim 5 wherein an agent sensitive coating is disposed on a surface of
2 said bimaterial cantilever, said agent sensitive coating being substantially transparent to said
3 electromagnetic radiation.

1 8. The apparatus of claim 5 wherein an agent sensitive coating is disposed on a surface of
2 said bimaterial cantilever, said agent sensitive coating being substantially reflective of said
3 electromagnetic radiation.

1 9. The apparatus of claim 5 wherein said detector detects the intensity of electromagnetic
2 radiation as received at said detector.

1 10. The apparatus of claim 5 wherein said detector detects the phase of electromagnetic
2 radiation as received at said detector.

1 11. The apparatus of claim 5 wherein said detector detects the angle of said electromagnetic
2 radiation as received at said detector.

1 12. A sensor comprising:
2 a corner cube reflector having three reflective surfaces that are mutually orthogonal in a
3 first sensing condition, wherein at least one of said reflective surfaces is a surface of a bimaterial
4 cantilever that goes from a substantially planar shape when said corner cube reflector is in said
5 first sensing condition to a curved shape when said corner cube reflector is in a second sensing
6 condition;

7 a source of electromagnetic radiation for projecting said electromagnetic radiation to said
8 corner cube reflector; and

9 a detector disposed to receive electromagnetic radiation as reflected from said corner-
10 cube reflector, said received electromagnetic radiation having of a first state corresponding to
11 said first sensing condition of said corner cube reflector and having of a second state different
12 from said first state and corresponding to said second sensing condition of said corner cube.

1 13. The apparatus of claim 12 wherein said bimaterial cantilever is chosen from the

bimaterial group of Au-Si, Pd-Si, Au-Si₃N₄, and Pd-Si₃N₄.

14. The apparatus of claim 12 wherein an agent sensitive coating is disposed on a surface of said bimaterial cantilever, said agent sensitive coating being substantially transparent to said electromagnetic radiation.

15. The apparatus of claim 12 wherein an agent sensitive coating is disposed on a surface of said bimaterial cantilever, said agent sensitive coating being substantially reflective of said electromagnetic radiation.

16. A sensing method comprising the steps of:
providing a corner cube reflector having three reflective surfaces that are mutually orthogonal in a first sensing condition, wherein at least one of said reflective surfaces is a surface of a bimaterial cantilever that goes from a substantially planar shape when said corner cube reflector is in said first sensing condition to a curved shape when said corner cube reflector is in a second sensing condition;

providing a source of electromagnetic radiation for projecting electromagnetic radiation to said corner-cube reflector; and

providing a detector disposed to receive electromagnetic radiation as reflected from said corner-cube reflector, wherein said received electromagnetic radiation has a first state corresponding to said first sensing condition of said corner cube reflector and has a second state

Navy Case No. 84930

12 different from said first state and corresponding to said second sensing condition of said corner
13 cube.

1 17. The method of claim 16 further comprising the step of coating a surface of said bimaterial
2 cantilever with an agent sensitive coating that is substantially transparent to said electromagnetic
3 radiation.

1 18. The apparatus of claim 16 wherein an agent sensitive coating is disposed on a surface of
2 said bimaterial cantilever, said agent sensitive coating being substantially reflective of said
3 electromagnetic radiation.